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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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NOV - 9 1992

In the Matter of

Amendment of the Commission's
Rules to Establish New Personal
Communications Services

)
)
) Gen. Docket No. 90-314
) ET Docket No. 92-100
)

Federal Communications Commission
Office of the Secretary

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Federal Communications Commission
Office of the General Counsel

**COMMENTS OF PAGEMART, INC.
ON NOTICE OF PROPOSED RULEMAKING**

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ON NOTICE OF PROPOSED RULEMAKING

PageMart, Inc. ("PageMart"), by its attorneys, hereby submits its comments on the Notice of Proposed Rule Making and Tentative Decision ("Notice")¹ in the captioned proceeding. In the Notice, the Commission requests comment on several policy issues that will be crucial to the expeditious implementation of the family of services known as personal communications services ("PCS"). PageMart filed pioneer's preference applications for both narrowband and broadband PCS, but focuses these comments on spectrum allocation for narrowband services.

INTRODUCTION

The Commission adopts four fundamental principles for PCS in its Notice: universality, speed of deployment, diversity of services, and competitive delivery.² The Commission will succeed in realizing these goals only with an emphasis on competition in its decisions on spectrum allocation. Rather than attempting to mold the PCS market artificially by trying to predict which services will succeed or fail, the Commission should allow consumer demand to shape the burgeoning PCS industry. By adopting a regulatory approach that encourages a wide diversity of service options, the Commission will prevent technical criteria from serving as the functional equivalent of policy decisions. In contrast, overly rigid decisions on key issues such as spectrum allocation risk freezing today's technology as tomorrow's, a regulatory mistake that could result in a distorted marketplace in the present and costly restructuring in the future.

¹ 7 FCC Rcd. 5676 (1992).

² *Id.* at ¶ 6.

Regulatory flexibility is particularly significant for narrowband PCS, as most of the messaging services proposed in ET Docket 92-100 will reach the marketplace well before broadband PCS. In order for the market to determine which narrowband PCS options customers truly desire with the least amount of regulatory delay, the Commission must develop a plan for diverse spectrum allocations that support all of the various categories of narrowband PCS that have been proposed. A uniform inflexible channelization plan for narrowband PCS would prevent some PCS options from reaching the market in the first instance, and thus undermine the Commission's policy of encouraging competition by. Therefore, the Commission should break down the three MHz allocated for narrowband PCS into differently sized blocks, including small, medium, and relatively large sections. In this way the two competing technical approaches to PCS—simulcast and frequency reuse—can be tested in the marketplace. By coupling such a variable allocation scheme with safeguards against warehousing and speculation, the Commission can permit all of the different categories of PCS either to flourish or vanish.

Allocating spectrum by service category, with several providers for each type of service, would optimize the competitive delivery of service options to consumers. Equally important, however, is the size and distribution of the geographic service areas established for narrowband PCS. Particularly with lottery licensing procedures, service areas that are too small would seriously delay the availability of 900 MHz services. Small service areas would geometrically increase the transaction and acquisition costs associated with aggregation of spectrum. Small service areas also would discourage necessary support from manufacturers of both network and subscriber equipment by preventing economies of scale in production. Thus, national allocations are critical to achieving the Commission's goal of developing PCS quickly and efficiently.

In order to enhance competition for broadband PCS, the Commission should strictly forbid participation in the PCS marketplace by the local exchange carriers ("LECs"). If the Commission allows entrenched monopolists such as the LECs to enter the fledgling PCS market, there is a risk that they will cross-subsidize PCS service using their monopoly funds. If this occurs, other equally efficient PCS providers, who have no monopoly source of cross-subsidy, will be driven

from the marketplace. This would harm both the LECs' monopoly ratepayers, who would overpay for their services, and the PCS marketplace, where efficient competitors would be unable to compete. This would result in a decreased number of services available to consumers at higher rates.

I. THE COMMISSION SHOULD ADOPT A DIVERSE SPECTRUM ALLOCATION PLAN AND NATIONAL SERVICE AREAS TO MAKE NARROWBAND PCS COMPETITION POSSIBLE

In the Notice, the Commission seeks comment on how to structure the narrowband PCS marketplace. It asks how large spectrum blocks should be, how many providers should be allowed to participate, how large the service areas should be, and which licensing mechanism should be implemented. In each of these areas, the Commission should encourage competition.

A. The Commission Should Divide the Narrowband PCS Spectrum Into Various-Sized Blocks to Accommodate the Needs of as Many Competitors as Possible

In the Notice, the Commission proposes three alternatives for spectrum allocation in the 900 MHz band. In the Commission's first alternative, 50 kHz would be grouped into 20 paired and 20 unpaired blocks.³ In this alternative, the Commission seeks comment on whether PCS providers requiring more spectrum should have the opportunity to aggregate spectrum to meet their needs and whether an upper limit should be placed on the amount of spectrum each provider could obtain. The Commission's second alternative would divide narrowband spectrum into four pairs and four blocks of 250 kHz each.⁴ Thirdly, the Commission suggests dividing narrowband spectrum into two paired blocks of 500 kHz each and a single MHz block.⁵ The Commission also invites commenters to recommend alternative channelization plans.⁶

³ *Id.* ¶ 51.

⁴ *Id.* at ¶ 52.

⁵ *Id.*

⁶ *Id.*

The Commission will fundamentally shape the PCS marketplace when it decides how to divide the spectrum for narrowband PCS. On the one hand, if the Commission decides to constrain the amount of spectrum that providers can obtain by adhering to a fixed spectrum plan, potential competitors will be excluded from the PCS market. Even in the initial pioneer's preference applications for narrowband PCS, proponents offered a variety of different services with differing spectrum needs, from 25 kHz or less to 200 kHz or more. Sources that may develop in the future may well require spectrum allocations different from those proposed to date. Thus if the Commission allocates spectrum in uniformly-sized blocks, these blocks will be too small for some PCS providers, and too large for others. Providers would be forced to curtail their innovations and change their PCS plans to conform to the spectrum allocation or to delay implementation until they can obtain their needed spectrum in the aftermarket. With a fixed spectrum plan, the Commission therefore risks standardizing the PCS market before any of the services are even implemented.⁷

On the other hand, if the Commission attempts to avoid the negative impact of uniform allocations merely by permitting aggregation and disaggregation, delay in implementation will necessarily result.⁸ Either a 50 or 500 kHz plan, for example, would require most of the services proposed to date for narrowband PCS to aggregate or disaggregate spectrum in order to assemble appropriately sized spectrum blocks. Only entrenched, wealthy players would be able to afford the transition costs of aggregating spectrum to meet the needs of their technology. In contrast, the Commission's proposal to permit disaggregation is an inefficient solution to allocating a given provider too much spectrum because the excess spectrum will by definition remain unused until it is sold.

⁷ The Commission should recall the disastrous results that occurred when it attempted to standardize color television too soon. CBS standard immediately became obsolete after the Commission selected it. See 41 F.C.C. 111 (1950) (adopting CBS standard), 41 F.C.C. 658 (1953) (deleting rules for color television).

⁸ The Commission left the standard for AM Stereo to the market. Because of the Commission's inaction, AM Stereo technology has never emerged. See 3 FCC Rcd. 405 (1988).

In light of the undesirable effects that will arise from uniform, fixed allocation schemes, even if coupled with opportunities for aggregation and disaggregation, the Commission needs to take a balanced approach. The Commission must provide spectrum for as many of the services currently proposed as possible while leaving room for the services of tomorrow. If the Commission cannot accommodate all of today's proposed service options, it cannot hope to do so in the future.

1. Simulcast and Reuse Approaches

There are basically two different types of narrowband PCS proposals before the Commission. One type would provide incremental improvements to paging, including acknowledgement, air-to-ground service, and wireless facsimile transmission. Acknowledgement paging would entail the least amount of spectrum. The other type of service proposed contemplates high throughput messaging, including text, data, and graphics. Narrowband PCS providers propose to deliver this high throughput messaging in two fundamentally different ways: simulcast and frequency reuse systems.

Simulcast systems would use a single channel to transmit information at high speeds. Because they propose to send data at these high speeds, simulcast systems require costly subscriber equipment but less spectrum. The technology to send data at high speeds, however, has yet to be developed. Frequency reuse systems such as PageMart's Personal Information Messaging Service ("PIMS") would use multiple channels to send information, at slower speeds, with throughput as much as nine times greater than present simulcast systems. Although PIMS can support data rates as high or higher than any simulcast system, PIMS is designed at slower speeds at present in order to offer a low-cost service to the mass market. Frequency reuse systems need more spectrum than simulcast systems, but are significantly more spectrally efficient in the total volume of subscribers and messages supported relative to their spectrum needs.

The Commission should not decide which services consumers will prefer, but should implement a channelization plan that will allow all of the narrowband PCS alternatives to be tested in the marketplace. For example, PageMart's PIMS will require 200 kHz for its multichannel

frequency reuse technology, plus 25 kHz for a polling channel and return links, for a total of 250 kHz. Other services, such as those that use simulcast technology, require 50 kHz. Messaging with ACK/NAK utilizes 25 to 50 kHz in the forward channel and 25 kHz for the acknowledgement service. If the Commission were to limit every applicant to the same single size block—no matter whether 25, 50, or 250 kHz—some PCS providers would get less than they needed and some would get more. This would be both unequitable and wasteful. Under PageMart's unequal channelization plan, each type of service would get exactly as much spectrum as it needed.

2. Symmetrical and Asymmetrical Designs

The narrowband PCS proposals before the Commission include both symmetrical and asymmetrical systems. Symmetrical systems assume equal and fixed amounts of spectrum both to send and return data. Cellular telephone is one such service, as are SMR Data, Cellular Data, and Echo. Thus, to the extent there is any near-term demand for symmetrical wireless data, these services already provide a sufficient infrastructure. PageMart's PIMS is asymmetrical. This means that there is no fixed system allotment of spectrum to either outbound or inbound data transmissions. Rather, because the system dynamically reassigns channels to either inbound or outbound use on the basis of instantaneous demand, the system does not require spectrum in fixed channel pairs. The channels can be asymmetrically allocated by the system provider.

Just as a single, uniform spectrum allocation will not meet the needs of both the simulcast and frequency reuse models, a paired allocation ignores the reality of the various narrowband PCS proposals. For example, in the Commission's first alternative, it proposes to allocate 50 kHz of paired spectrum.⁹ Pairing is necessary only in a symmetrical design exclusively for two-way interactive data. However, as demonstrated by Motorola, market demand for narrowband PCS will over at least the next decade be largely for sending data, which would not require symmetrical paired channels, but could be provided over a more spectrum efficient asymmetric system

⁹ Notice at ¶ 51.

design.¹⁰ Therefore, if the Commission allocates paired spectrum, it will be acting on its own preconceived notions of interactivity when the market might only demand non-interactive, asymmetric applications in the near term. This would represent a significant waste of spectrum. As demand does develop over time for full two-way interactive data in narrowband PCS, providers should have the flexibility to dynamically reassign spectrum to support such services. At this time, however, there are already many two-way services on the market, and the Commission should not presume that they need to be replicated.

3. PageMart's Proposal

None of the Commission's proposed alternatives will fully satisfy the needs of all participants in the PCS marketplace. Instead of any of its alternatives, the Commission should favor competition by tailoring spectrum allocation to the services that the various PCS providers have proposed. To accommodate a rich variety of narrowband services, a spectrum allocation plan must employ variously sized frequency blocks and avoid symmetrically paired blocks. PageMart's proposed allocation plan, set forth in detail in the attached charts, accomplishes both of these objectives. Under this proposal, the Commission would divide the narrowband spectrum into five 200 kHz, ten 50 kHz, and twenty 25 kHz sections, with the remaining 1 MHz a "quiet" band reserved for return links. This spectrum scheme will support acknowledgement paging, simulcast, frequency reuse, and asymmetrical applications.

Each advanced messaging service offers unique capabilities for consumers. The Commission might be concerned that it should allocate spectrum according to the most cost-effective PCS proposal before the Commission. However, an analysis of cost effectiveness involves many factors, not just the cost of the network. In addition to the network investment, transmission and receive facilities must be constructed in both simulcast and frequency reuse systems to receive return messages. Only a detailed cost per message analysis could truly reflect a comparison between these infrastructure costs and capacity. Even if the Commission could do

¹⁰ Motorola Ex Parte, ET Docket. No. 92-100 (Filed Oct. 6, 1992).

these cost studies, however, they would expend valuable Commission resources and time only to imperfectly imitate the market. Only the market can and should determine which technology is most cost-effective. It is not the province of the Commission to decree whether one competitor will eventually prevail over all others. By allocating a range of spectrum, numerous services can be made available, and actual market demand can determine the “best” or most “cost-efficient” services and providers.

If the Commission opts to provide a diverse spectrum allocation for narrowband PCS, it should take careful steps to guard against speculation and warehousing, which might unfairly disadvantage smaller competitors who would otherwise fill service gaps. Without these safeguards, lottery applicants with no intention of building a PCS system might win spectrum and sell it to legitimate PCS providers for profit. Other applicants who are PCS providers might attempt to win as many large blocks as possible to prevent other PCS providers from entering the market while letting the spectrum lie fallow. In order to prevent these potential abuses, the Commission should limit the eligibility for large blocks of spectrum to potential PCS providers who would build frequency reuse or other types of systems that would genuinely need the spectrum. PageMart is willing to make such a commitment to building a frequency reuse system now.

B. The Commission Will Further Its Diversity Goal If Its Allocation Plan Permits as Many Services as Possible to Participate in the Market for PCS

The Commission tentatively concludes in the Notice that it should provide sufficient spectrum to support a minimum of three PCS providers.¹¹ Although the Commission states that the ideal scenario would be to allocate enough spectrum to support all PCS proposals and to let the market determine the optimum number of service providers, it resigns itself to the idea that this is not possible due to the necessarily limited spectrum available for PCS.

¹¹ Notice at ¶ 34.

The Commission is not allocating a limitless amount of spectrum for narrowband PCS, and it must balance the amount of spectrum it allocates with the number of providers that are allowed to participate. However, the needs of the various PCS providers in the 900 MHz band will be so relatively small that the Commission can make enough spectrum available to support *intermodal* competition between different types of narrowband PCS services. Especially compared to the amount of spectrum that the Commission proposes to allocate in the 2 GHz band for broadband PCS, the tradeoffs that the Commission will have to make in narrowband PCS are minimal.¹²

Thus, the Commission's assessment that there is a scarcity of spectrum for narrowband PCS is unrealistic. Even given the three MHz limit imposed by the Commission in the 900 MHz band, there is still plenty of spectrum to support many more than three providers. For example, if divided evenly among the three different types of PCS systems proposed, the available spectrum could support as many as 35 providers. With 1 MHz of spectrum for a return band, there would still be room for five frequency reuse systems, 10 simulcast providers, and 20 acknowledgement paging systems.¹³

Variably sized spectrum blocks will actually enhance competition rather than thwarting it. For example, under this scheme, frequency reuse systems will compete not only with other frequency reuse systems but also with simulcast and acknowledgement paging systems as well. If when the Commission speaks of competition in the Notice it means a panoply of different services

¹² PageMart would argue that the Commission is in fact giving too much spectrum to broadband PCS in the 2 GHz band without focusing on proposals that would use wireline networks more extensively. PageMart proposed such a system, its Personal Radio Telephone Service ("PRTS"). PRTS would integrate mobile and wireline technology to create a seamless service. See In the Matter of PageMart, Inc. Request for a Pioneer's Preference in licensing in the Commission's Personal Communications Service for a New Nationwide and Local Personal Radio Telephone Service for Personal and Business Use (Gen Docket. No. 90-314). The 3 MHz limit is also quite small compared to the additional 6 MHz each television station will receive for advanced television, another emerging technology.

¹³ See PageMart's proposed allocation plan, attached as Exhibit A.

all vying for a place in the market, it should allocate differently sized spectrum blocks to realize this goal.

C. The Commission Should Set National Service Areas

The Commission queries in the Notice whether it should create nationwide service areas or subdivide the country into regions.¹⁴ The Commission proposes three different sizes for regions: the 487 “Basic Trading Areas,” the 47 “Major Trading Areas,” and the 194 telephone LATAs.¹⁵

The Commission should distribute spectrum for narrowband PCS on a nationwide basis only. Small service areas such as those proposed by the Commission would make spectrum aggregation difficult and costly. The more service areas there were, the more expensive it would become to assemble spectrum for PCS. For instance, even with just 47 Major Trading Areas, aggregating just two channels in each would require 94 separate transactions, in addition to 94 separate federal and/or state regulatory proceedings. At 194 or 487 areas, these numbers become even more daunting.

National service areas would also enhance economies of scale. Manufacturers of network and subscriber equipment will need commitments to produce large amounts before PCS will be a cost-effective venture. Without the substantial production volumes associated with national markets, manufacturers might not be willing to build narrowband PCS equipment at all. At the very least, the cost of equipment in each region will be higher.

D. The Commission Should Take the Procedural Steps Necessary to Prevent the PCS Lottery From Becoming Onerous

Because the Commission does not yet have authorization from Congress to conduct auctions, spectrum for PCS will most likely be allotted through the lottery process.¹⁶ In the Notice, the Commission raises several issues with regard to the lottery. It requests comment on

¹⁴ Notice at ¶ 62.

¹⁵ *Id.* at ¶ 60.

¹⁶ The Commission’s rules for lotteries are found at 47 C.F.R. § 1.972 (1992).

the merits of a “post-card” lottery versus one in which complete financial and technical information must be filed.¹⁷ It also seeks methods to reduce the costs and delays associated with lotteries.¹⁸

If the Commission were to adopt PageMart’s diverse spectrum allocation plan, a lottery *within each service category* would be an effective means to award spectrum.¹⁹ However, before a PCS provider should be able to win spectrum in the PCS lottery, it should have to meet certain minimum eligibility requirements. This should include a technical feasibility analysis that shows that the provider has a legitimate need for all of the spectrum it is entering the lottery to win. As discussed above, applicants for large spectrum blocks should have to show that they will be implementing a multichannel system in order to safeguard against speculation and warehousing.

II. CROSS-OWNERSHIP RESTRICTIONS SHOULD PRECLUDE LEC PARTICIPATION IN THE BROADBAND PCS MARKET

If PCS develops in a competitive environment, it promises to create a revolutionary new communications landscape. If incumbent communications providers are allowed to distort the competitive process, however, PCS could be relegated to the status of a minor service only supplemental to the entrenched wireline telephone monopoly.

If the Commission is truly dedicated to promoting the growth of a competitive PCS marketplace, it should take very clearly defined steps to prevent the LECs from participating in PCS.²⁰

¹⁷ Notice at ¶ 85.

¹⁸ *Id.* at ¶ 87.

¹⁹ To overcome the claim that the Commission would not be treating all applicants alike, the Commission need only create eligibility requirements for each service category. *Cf. United States v. Storer Broadcasting Co.*, 351 U.S. 192 (1956) (The FCC need only use its legitimate rulemaking power to establish eligibility requirements for applicants when treating otherwise similarly situated applicants differently).

²⁰ The Commission sought comment in the Notice on whether cellular operators should be able to obtain PCS licenses or provide PCS within their existing frequencies. The Commission also questions whether cellular operators should be limited to obtaining PCS licenses outside the cellular service areas. Because in most cases cellular companies are owned by, affiliated with, or have strategic alliances with one or more of the LECs, they have similar incentives to the LECs to cross-subsidize PCS. The effects of cellular cross-subsidies might even be harder to detect because of their status as affiliated or owned entities. Cellular companies, like the LECs, also have a considerable amount of infrastructure investment. If broadband PCS became a ubiquitous, two-way voice service, it would compete directly with cellular service. Cellular companies therefore have as much incentive as the LECs to protect their investment by delaying the implementation of PCS.

The Commission is familiar with the abuses that can occur when a monopolist enters a competitive market. Not only can the monopolist cross-subsidize services in the competitive market by shifting costs to and money from the monopoly market, it can also discriminate against competitors seeking interconnection to its wireline network. These tactics can subvert competition and drive rivals to the monopolist out of the market.

If the LECs were permitted to enter the broadband PCS market, they could shift their costs of competing in the PCS market to monopoly services.²¹ Monopoly ratepayers would fund the LECs' entry into PCS, subsidizing services that they might or might not use. This would result in an unfair, anticompetitive advantage for the LECs over other PCS providers; even more efficient competitors could not succeed with no access to monopoly services and ratepayers.

The LECs also have the incentive to squelch wireless technologies in order to protect their historic and highly lucrative monopolies in their wireline networks. Given their immense investment in wireline networks, the LECs have every incentive to fight competitive technology that might replace or pose significant threat to their investment. PageMart's PRTS proposal for broadband PCS would require interconnection to the wireline network. The potentials for abuse might be especially great if, as PageMart and other PCS providers suggest, PCS will only become ubiquitous if it can integrate wireless and wireline networks. While regulatory barriers to entry such as cross-ownership restrictions might seem inherently anticompetitive because as in this case the LECs would not be able to compete, the Commission should focus on the vitality of the PCS market in the long term.

In the Notice, the Commission seeks comment on whether it should set aside 10 MHz for

²¹ The Commission has grappled with cross-subsidization in both its Computer II and Computer III proceedings. *See* Amendment of Section 64.702 of the Commission's Rules and Regulations, 77 FCC 2d 384 (198), *modified on recon.*, 84 FCC 2d 50 (1980), *modified on further recon.*, 88 FCC 2d 512 (1981), *aff'd sub nom Computer and Communications Industry Ass'n v. FCC*, 693 F.2d 198 (D.C. Cir. 1982), *cert. denied*, 461 U.S. 938; Computer III Remand Proceedings, BOC Safeguards and Tier I LEC Safeguards, Report and Order, 6 FCC Rcd. 7571 (1991). In addition, Judge Greene dealt with of this behavior in his oversight of the AT&T Consent Decree. *See United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982), *aff'd*, 103 S. Ct. 1240 (1983). This Commission, the state commissions, and the antitrust courts have all recognized these problems.

the LECs in the 2 Ghz band for broadband PCS.²² The Commission should find that setting aside particular spectrum for the LECs would only guarantee that the PCS market will be uncompetitive. The Commission proposes to set this spectrum aside without even receiving a service proposal from the LECs or settling on a broadband spectrum allocation scheme. The advantages the Commission believes will result from LEC participation in PCS²³ are far outweighed by the threat the LECs pose to the survival of each PCS provider. The Commission's "set-aside" for LECs in cellular licensing was, in retrospect, clearly unnecessary. Nonwireline systems have proven to be at least as good technically and often superior in service and marketing. The cellular set-aside also resulted in "head start" problems in many markets, which distorted competitiveness in the market for years.

CONCLUSION

With a balanced approach that enhances competition, PCS will add a new dimension to the communications marketplace. If the Commission takes the foregoing steps to implement PCS, with enough intervention to make the market fair but enough flexibility for real competition to

²² Notice at ¶ 77.

²³ These include possible economies of scope, spectrum savings, and incentives for the LECs to configure their wireline architectures in a PCS-friendly manner. *Id.* at ¶¶ 73-74.

thrive, it will save itself future time and effort and allow PCS to become a reality with little regulatory delay.

Respectfully submitted,

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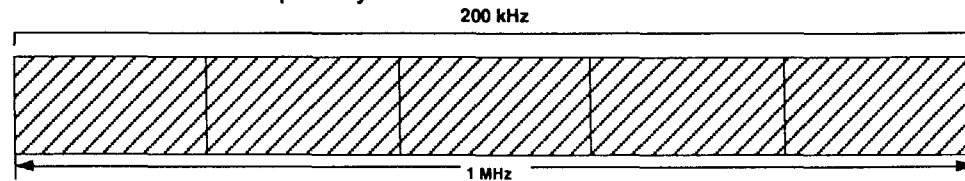
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EXHIBIT A

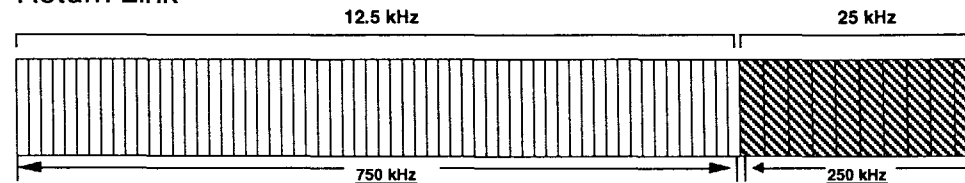
PageMart Narrowband PCS Spectrum Allocation Plan

900 MHz Band Plan Structures Based on Pioneer Preference Applicants

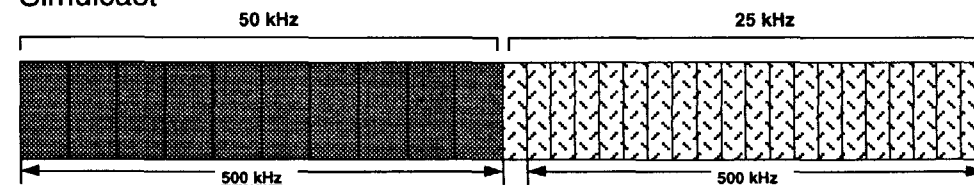
Multichannel - Frequency Reuse



Return Link



Simulcast



940 - 941 MHz

5 - 200 kHz data channels for multichannel messaging systems, with two-way capability, to be paired with one 25 kHz polling channel in 930 - 931 MHz band and one 25 kHz return link channel in 901 - 902 MHz band for a total of 250 kHz per licensee.

901 - 902 MHz

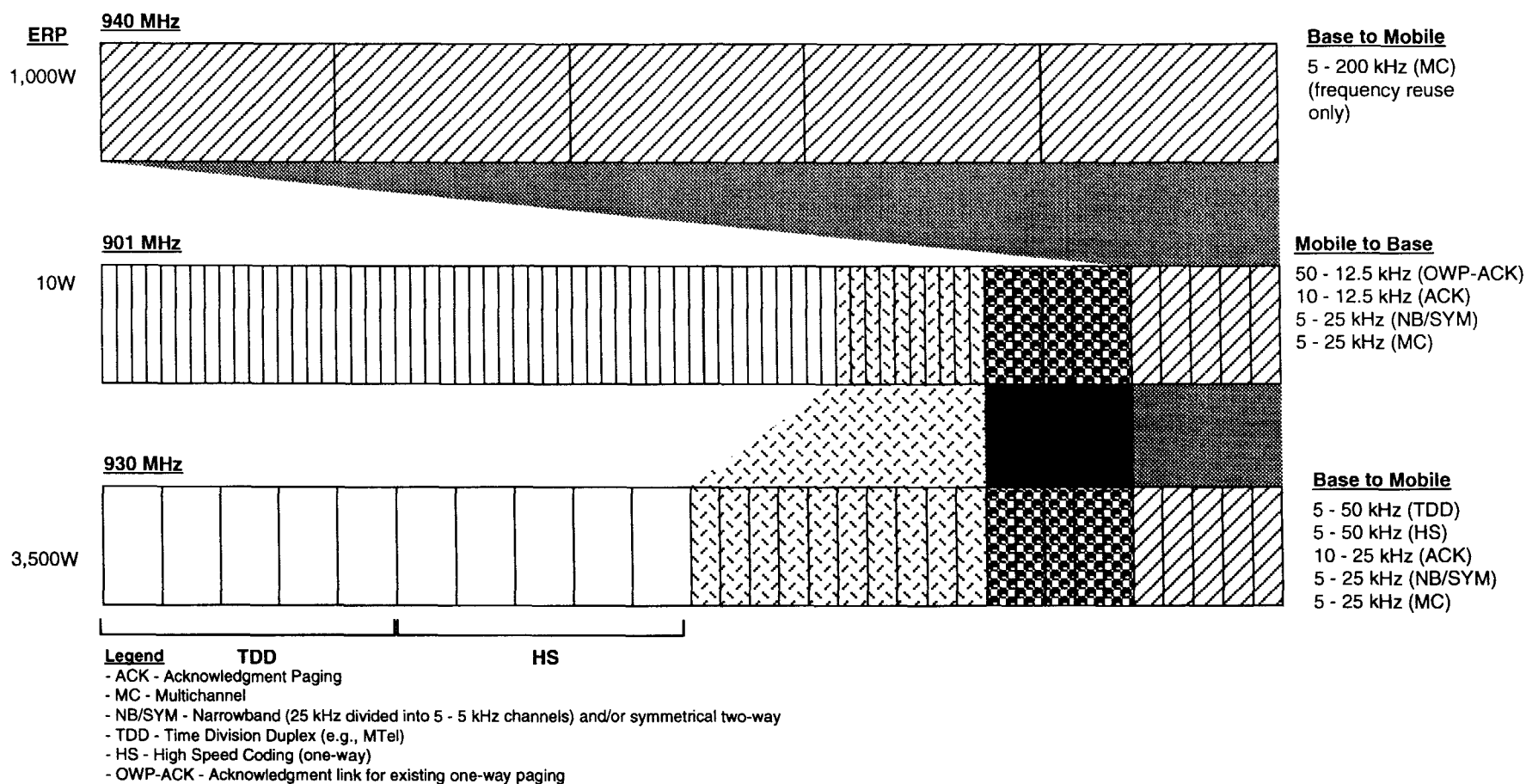
10 - 12.5 kHz return link channels for acknowledgment paging. 50 - 12.5 kHz channels for acknowledgment paging when paired to conventional paging channels in 931 or 929 MHz bands.

5 - 25 kHz channels for symmetrical two-way messaging (including narrowband two-way). 5 - 25 kHz channels for multichannel messaging systems.

930 - 931 MHz

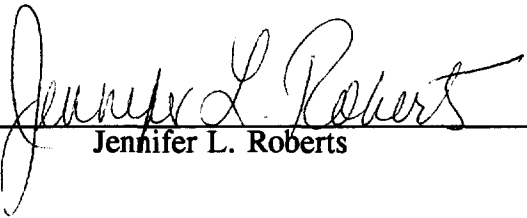
10 - 50 kHz channels. 5 for Time Division Duplex Applications including MTel and 5 for one-way high speed messaging. 20 - 25 kHz channels for acknowledgment paging, symmetrical two-way and multichannel messaging systems.

900 MHz Band Plan Structures Based on Pioneer Preference Applicants (Cont.)



CERTIFICATE OF SERVICE

I, Jennifer L. Roberts, do hereby certify on this 9th day of November, 1992, that I have served a copy of the foregoing **COMMENTS OF PAGEMART, INC. ON NOTICE OF PROPOSED RULEMAKING** via hand delivery to the persons listed below.


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